Electrical

Question1:-When I go to turn my dimmer off, it is very hot. Is this a fire hazard?

Answer: - Dimmers are rated for how many watts they are designed to handle. If a dimmer has to operate at or close to its full capacity, it will heat up. Some dimmers have metal fins on the front of them to enable proper heat dissipation. You can either reduce the wattage connected to the dimmer to alleviate the problem, or put in a larger-rated dimmer.

Question2:- I put new bulbs in my recessed lights and they turn on, stay on for a while, and they go back out. After a while, they will come back on again. What's going on?

Answer: - Recessed lights are supplied with a thermal overload. Because the fixture is inside your ceiling, it is important that excessive heat from the bulbs do not cause a fire. Because of this, the thermal overload acts as a thermometer i.e. when the heat reaches a preset temperature, it will disconnect the electric. When the fixture cools down, the electricity is reconnected. To avoid this problem, lower wattage lamps will generate less heat, try changing them. The recessed can should have a sticker on the inside of it listing the lamps which are compatible with it.

Question3:- We still have the round fuses instead of circuit breakers. Is this a safety issue?

Answer: - No, it is not a safety issue unless the fuse box is damaged or deteriorating. Fuses are actually more sensitive than circuit breakers; therefore they are safer than circuit breakers. The problem with circuit-

breakers is twofold. 1. After a fuse protects your home from an overloaded circuit, you have to throw it away. Therefore you may go through many fuses. Secondly, the majority of insurance companies now require that fuse boxes be replaced with circuit breakers.

Question4:- Are our 2-prong outlets still ok to use in our home?

Answer: - Most appliances and electrical devices today come with 3-prong plugs. The third prong is for grounding purposes. For safety issues, it is advisable to have everything in your home properly grounded; therefore, you should change them.

Question5:- What is a GFI?

Answer: - A GFI is an abbreviation for a Ground Fault Interrupter. It is a specially designed outlet normally used in wet locations to protect an individual from electrical shock. A GFI measures the resistance on the "positive" and "negative" loads connected to it. If there is more resistance in either of the 2 loads, the GFI trips. The electrical code requires that GFI's be installed in all kitchens, baths, and laundry areas.

Quetion6:-What should children know about electrical safety when they play outside?

Answer: -Assume overhead lines are powerlines and stay away from them.Do not climb trees, or fly kites near power lines.Never attempt to remove something that may be caught on an overhead line.

Never touch anyone who is in contact with a power line

Get inside at the first sign of lightning. Do not seek shelter under a tree.

Question7:-Which is safer; alternating current (AC) or direct current (DC)?

Answer: -Alternating current (AC) and direct current (DC) have slightly different effects on the human body, but both are dangerous above a certain voltage. The risk of injury changes according to the frequency of the AC, and it is common for DC to have an AC component (called ripple). Someone with special equipment can measure this, but the effect on a particular person is very difficult to predict as it depends upon a large number of factors. As a consequence you should always avoid contact with high-voltage electrical conductors, regardless of the type of electrical current they are carrying.

Question8:- What is the difference between 3 phase and single-phase electricity?

Answer: - I suppose the textbook definition would be something like this:
A phase is the factional part of the period of a sinusoidal wave, usually expressed in electrical degrees.
A single-phase circuit is an alternating-current using only one, sine wave type, current flow.
A three-phase circuit consists of three different sine wave current flows, different in phase by 120 degrees from each other.Now let's have the more practical, "down to earth" definition - something that the average homeowner would at least have a chance of understanding:
Single phase: A circuit that consists of three wires – lives, neutral, and ground (earth). The main breaker in a single phase system is a single pole breaker, resembling the others in the panel, only with a higher capacity.

Three phase: A circuit where the main breaker switches off three poles. For most home owners this is the equivalent of having 3 separate main breakers that are divided among the circuits of the home. There are 5 wires that normally constitute a three phase line, although in many homes the three phases simply supply the main and sub panels, but continue throughout most of the home as single phase lines. In most homes there are not many devices that run on three phase electricity. However, examples may include a three phase central air conditioner, a three phase oven, a 3 phase swimming pool pump, or a large 3 phase hot water boiler.

Question9:- Do I need a surge protector for my computer?

Answer: -Most neighborhoods in Israel still have relatively frequent power surges. Most people are well acquainted with the normal surges that cause permanent damage to appliances in a blink of an eye. But few people are aware of the smaller surges that are going on all the time. Unlike the larger surges that wreck havoc all at once, these smaller surges can slowly wear out the wiring insulation and electronic circuitry in your appliances, causing them to operate improperly and wear out prematurely. A good quality surge protector can do a lot to protect your computer as well as other appliances. I personally recommend buying a UPS for your computer. They may be slightly more expensive, but afford your computer much more protection. (For more information on surge protectors and UPSs see: "The Guide to Surge Protectors" and "Do You Need A UPS?")

Question10:- What is the difference between a surge protector and a UPS?

Answer: -A surge protector is a device that simply protects your computer (or any other appliance) from electrical surges, spikes, and other fluctuations in the voltage. Surge protectors vary greatly in both price and quality. It's usually wise to stay away from the "cheapy" models. They will give you very limited protection, if any.

A UPS (Uninterrupted Power Supply) usually has surge protection built in, but that's not all. It has a battery backup that offers you at least a few minutes time (if not longer), to save your work and turn off your computer (or other device) properly. Most have a communication cable between the computer and the UPS, to signal the computer when the UPS battery is low. This tells the computer to start shutting down automatically without you having to be there.

Another plus in having a UPS is that it eliminates the frequent, short blackouts or brownouts (common to many areas around Israel) which cause havoc with your hard drive. This can cause the drive to malfunction prematurely and have permanent damage.

(For more information on surge protectors and UPSs see: "The Guide to Surge Protectors" and "Do You Need A UPS?") Professional Electrician Isn't it about time that your electrical problems were solved? Jerusalem (Israel) and surrounding areas. Surge Protection Protect all your electronic equipment with just one device in your electrical panel. Installed by a professional electrician.

Question11:- I have many appliances with two prong plugs, and my outlets are made to accept three prong plugs. Is using 2 prong plugs in the 3 prong outlets dangerous?

Answer: -Most appliances that are bought in the store with a two prong plug are either made of plastic and do not need a ground wire, or are double insulated, in which case it would actually be dangerous to have it grounded.

If the plug was installed by someone other than the factory or a reliable electrician, then it should be inspected by someone trustworthy.

Question12:- In the States, we bought air conditioners that were rated in BTU. Here they are rated in kilowatts. How do we convert one to the other?

Answer:- BTU/hour = 0.000293 KW

BTU (British Thermal Unit), is a British standard unit of energy. One BTU is the amount of heat energy needed to raise the temperature of one pound of water by one degree F. This is the standard measurement used normally in the western countries to measure the output of many air conditioning and heating devices.

There is also a kilowatt of energy which is sometimes used instead of BTU, but this can easily be confused with the more common use of kilowatt as a unit of power (which is actually 1000 watts).

Here in Israel, it is not uncommon for salesmen to try and sell you an air conditioning unit on the merit of its kilowatt consumption (power input) instead of its cooling power, thus selling you a less efficient model.

Therefore I recommend that you continue to ask for the BTU rating (which

they must give you) when comparing the cooling capacity of air conditioning units.

Question13:- Can I put a timer on a water boiler so that it will go on even if I'm not home?

Answer: -Of course you can. In Israel you usually have a choice of either replacing the existing water boiler switch with one that incorporates a timer, or installing a timer in the electrical panel to control the boiler line. A reliable electrician can tell you which would be best in your case.

Question14:- What is the difference between a transformer, a converter and a power supply?

Answer:- A Transformer is an electrical device by which alternating current of one voltage is changed to another voltage using coils. There are several different types, but they all basically do the same thing - change the voltage. They are usually heavy for their size due to the weight of the coils (size and weight depends on their rating).

A Converter is an electronic device that is used in some cases instead of a transformer. The converter doesn't actually lower the voltage, but rather delays each electrical cycle making the device think it is working with the proper voltage (does not produce an output of full sine wave electricity). If you were to measure with a voltmeter the output of the converter, it would actually measure 220V (in Israel). These converters are not to be used with any electronic devices, and I personally do not recommend using them with ANY device. Although they are sold for use with hair dryers, bottle warmers, irons, etc, I've seen too many of these appliances ruined when used with a converter.

In actual fact, anything that supplies power is a Power Supply. But usually when people talk about power supplies, they are talking about a device that not only lowers the voltage, but also converts AC (alternating current) to DC (direct current). These are what you find on many small electronic devices (walkman, cordless telephones, desk clocks…etc), looking like a small black box that gets plugged in the receptacle, and having a cord that plugs into whatever device you're using. If you come from the US with a device using a power supply of this type rated for 110V, simply buy the 220V equivalent here in Israel. They are relatively inexpensive and work exactly like their 110V cousin. Make sure to bring the 110V power pack with you so you can be sure of buying exactly what you need.

Question15:- I am told that using my air conditioner for heating costs less than using regular electric room heaters. Is this true?

Answer:- Electric resistance heat (your small electric heater) works by converting electric current into heat. These heaters come in a wide variety of types and designs (baseboard heaters, radiant, convection space heaters...). All convert almost all of the electric current to usable heat and are generally considered to be 98-100 percent efficient. However, it is usually considered one of the most expensive means of heating.

Air-conditioning units use a heat pump system to heat your home. Heat pumps use electricity to move heat from one place to another. During the winter, the heat is directed inside your home while the cold air is thrown outside. The reverse is done in the summer to cool your home off. This form of heating is much more economical.

All this notwithstanding, I’m not sure that I would recommend purchasing an air conditioning unit just for the heating. In my opinion, it would take too

many years to save enough in heating costs to warrant the cost of the unit itself (which can be costly). But if you intend to buy an air conditioner for the summer months anyhow, or already have one installed, by all means use it in the winter for heating and save on your heating costs.

Question16:- Sometimes the main breaker jumps but none of the smaller ones do. Why does that happen?

Answer:- A basic, standard electrical panel found in many homes includes, in addition to other parts, a main breaker, and other "line" breakers. The main breaker supplies electricity to the line breakers, and is rated at a higher current rating (usually 25 or 40 amps in a standard one phase system). The other breakers supply electricity to the various lines around your home (usually rated between 10–20 amps).

Let’s assume that your main breaker is rated at 25 amps, and you have 5 other breakers rated at 10 amps each. Now let us suppose that you are using on each line (each 10 amp breaker) only 8 amps. Each 10 amp breaker, having only 8 amps going through it, would be fine. They would have no reason to trip. But if you add up what each breaker is using, you get 40 amps. This is way over the amount that your main breaker is rated for, and will therefore cause it to trip.

Question17:- Both the main breaker and the main ground-fault interrupter turn off everything in the house. What is the difference between them?

Answer:-True, in a standard Israeli panel, both the ground-fault and the main breaker shut off everything in the home. But they both jump for completely different reasons.

A breaker basically cares how much current is going through it and it really doesn't care what you do with it. So, for example, if you had an outlet on a 16 amp line (breaker). You can plug in a heater, toaster, hairdryer, and even stick your finger in the socket (G-d forbid), but as long as you don't take more than what the breaker is rated for (16A in this case), it will continue to work.

The ground-fault interrupter (GFI) on the other hand, even though it's physically built for a range of current, it really doesn't care how much current is going through it. Whether it's 10A, 16A, 25A, or 1000A - as long as what is going in is making a complete circuit, and nothing is escaping, the GFI is quite happy to continue working. BUT, once some current "leaks" from the line out to someplace else, the GFI will jump immediately. This is why it is sometimes referred to as "The Safety Device". If someone would, G-d forbid, stick their finger in an outlet, part of the electricity from the line would flow through their body and on to the ground that they are standing on. The ground-fault would sense this (that not all the electricity going into the line is through the proper circuit) and jump, possibly saving his/her life.

You can have a situation where both the ground-fault and the main breaker (or specific line breaker) jump together. That would happen when a live wire shorts with something other than the neutral wire (i.e.: if the live wire of a room heater shorts with its metal body).

To summarize, the breaker jumps when too much current is being used (including a short), and the ground-fault jumps when there is a leakage of current from the line.

Question18:- Can I simply upgrade my breaker to one with a higher rating, so to keep it from jumping all the time?

Answer:-Definitely not! Each breaker in your panel is there for the sole purpose of protecting the wires that run through that particular line. If, for example, the wires are a size that need a 10A breaker to protect them, and you were to switch the breaker to a 20A, you would be causing a potentially dangerous situation. There would be nothing to protect the wires from burning up and taking the whole house with them.

Question19:- Why does my florescent fixture make a humming sound?

Answer:-The ballast in florescent fixtures often causes a humming sound while the fixture is on. There are a number of possible causes for this. One cause could possibly be loose laminations in the core. However, manufacturers claim that this is not common.

Another, more likely cause, can be magnetostriction. Magnetostriction is the deformation of a ferromagnetic material subjected to a magnetic field. In other words, when the magnetic field produced by the ballast slightly changes the positions of the molecules in the metal, this creates a constant cycle of shrinkage and expansion that produces an audible hum.

Another possible cause, (or at least may contribute to the cause) is the way the ballast is mounted onto the surface. A simple fix is to install vibration-isolation pads between the ballast and its mounting surface to dampen the noise.

Question20:-Can I get electrocuted by batteries?

Answer:-You sure can, but you would need a lot of batteries to accomplish this. Regular everyday batteries are safe because they have such low voltage.

You need a high enough voltage in order to get the current flowing through your body. Human skin is not a good conductor. It takes about 40 volts, or more, of electrical pressure to penetrate your skin and create an electrical current inside your body dangerous enough to harm you. Most of the batteries we use are 12 volts or less. On the other hand, if the current finds a way to penetrate the skin (through a cut or other opening), then even a 12V battery could be dangerous.

Question21:- What do the colors of the plastic insulation mean on wires?

Answer:-They are designed to indicate their use. In Israel, the wires carrying current at full voltage are usually brown. Neutral wires are usually blue. Ground wires are usually yellow with a green stripe. Much caution must be applied, because wires are not always hooked up correctly. There are also older houses wired with the “old” colors, which are red (hot wire), black (neutral), white (ground), and blue (returning hot).

Question22:- I have never had a doorbell installed. Is there an easy and quick way to install one?

Answer:-Yes. You can install a wireless doorbell.

Question23:- How can I know how many amperes my appliance uses?

Answer:-The easiest way is to simply look for where it is written on the appliance. Many appliances have it marked somewhere. If not, then you can divide the watts by the volts (example: 2000 watts / 220 volts = 9.09amps). This isn’t 100% accurate because you usually have other

elements that come into play, such as efficiency and a power factor. But for a "ball park" calculation it’s probably good enough.

Question24:- How can I stop static electricity?

Answer:-An electric charge is produced when two pieces of material are rubbed together, such as when you walk across a carpet and get a shock when you touch an object. In this example, you are building up a charge by having your shoes rub on the carpet, and this charge is transferred to you and is discharged on the object. These charges are called static electricity. You get static electricity when one material (even insulators such as rubber or glass) transfers its electrons to another.

Static electricity occurs quite often when the weather gets cold and the moisture in the air is low. Therefore, adding moisture to the air would be a big help. Grounding is the best way of removing static electricity, but is not always practical. Using humidifiers or placing water next to heating ducts can help. Moisture in the air will be absorbed by the carpet fibers. Some carpets are made out of antistatic materials.

Question25:-Why do we use AC electricity instead of DC in our homes?

Answer:-Power is the product of voltage x current (P = VI). For any given amount of power, a low voltage requires a higher current, thus requiring a larger size conductor (P = I2R) to transfer it from one place to another. Therefore it is more economical to transfer power using high voltage, thus requiring a smaller diameter cable.

It is very difficult to transform DC power to a high-voltage, low-current form efficiently; therefore it is not transmitted for distances greater than one mile without introducing excessive voltage drops.

On the other hand, AC power can be changed with ease using transformers to change the voltages. This makes it much more practical to use for distributing purposes. Even in your home, AC transformers can be found in use with many appliances.